

## REMARKS

The Office Action dated October 1, 2008, has been received and carefully considered. In this reply, claims 4 and 11 are canceled (claims 2, 3, 12, 13, and 22 to 53 have been previously canceled), and claims 1, 5, 6, 8 to 10, and 20 are amended. Applicants respectfully submit that the amendments present the claims in better form for allowance. Applicants further submit that the amendments do not add new material, and support for the amendments may be found in the specification and drawings as originally filed. Further, claims 1 to 6, 8 to 13, 20, and 22 to 53 are or have been amended or canceled without disclaimer and without prejudice. Applicants reserve the right to pursue the inventions of the originally filed claims later during the prosecution of this application or during a subsequently filed application. Reconsideration of the outstanding rejections in the Office Action is respectfully requested in view of the following remarks.

### **Claim Objection**

Applicants respectfully traverse the claim objection of claim 14. At page 2 of the Office Action, claim 14 stands objected for failing to further limit the subject matter of a previous claim, and more specifically claim 1, with respect to the surface impurity level. With respect to claim 1, the surface impurity level is not greater than include two times the bulk impurity level (effectively, 0 to 2 X the bulk impurity level), and for claim 14, the surface impurity level is not greater than the bulk impurity level (effectively, 0 to 1X the bulk impurity level). Clearly, the scope of independent claim 1 is greater than the scope of dependent claim 14, and therefore, claim 14 is in proper dependent claim format. Applicants respectfully request withdrawal of the claim objection.

### **Obviousness Rejection of Claims 1, 5, 6, 8, 9, 14 to 19 and 21**

Applicants respectfully traverse the rejection under 35 U.S.C. § 103(a) of claims 1, 5, 6, 8, 9, 14 to 19, and 21 as being obvious over U.S. 6,277,194 ("Thilderkvist") in view of U.S. 2003/0198749 ("Kumar"). Claim 1 is drawn to a semiconductor processing component comprising a substrate and a layer. The substrate consists essentially of (i) SiC or (ii) SiC impregnated with elemental silicon, and the layer consists essential of CVD-SiC and is directly

on the substrate. Support can be found in Paragraphs [0022] to [0024] of the Present Application.

Thilderkvist is directed to a method for in-situ cleaning of surfaces in a substrate processing chamber. More particularly, Thilderkvist teaches a method of removing contaminants from a surface in a silicon substrate processing chamber. The method includes coating the surface which has been exposed to contaminants including metal particles with a material preferably including silicon. During coating, Thilderkvist teaches that contaminants are collected by the material being applied. The method further includes removing the material and any contaminants that have been collected by the material during coating. Referring to FIG. 3 of Thilderkvist, coating and removing is performed for each wafer processed. Thus, many layers will be coated and removed as many wafers are processed.

Thilderkvist teaches using different materials so that a sacrificial layer can be selectively removed from underlying components. For example, a susceptor may include graphite (C) or SiC, and the sacrificial layer can include Si, such as polycrystalline Si or amorphous Si. Thilderkvist teaches forming the sacrificial Si layer over the graphite or SiC, diffusing particles from the graphite or SiC into the sacrificial Si layer, and then removing the sacrificial Si layer. Because different materials are used in Thilderkvist, the coating and removing the sacrificial Si layer can be repeated many times as taught in Thilderkvist without adversely affecting the underlying graphite or SiC.

Applicants respectfully submit that one of ordinary skill in the art would not have modified Thilderkvist to use the same material for the sacrificial layer and the underlying susceptor in view of the repeated coating and removal of the sacrificial layers. If Thilderkvist would be modified such that the underlying susceptor and sacrificial layer to both include SiC, the removal of a sacrificial layer would also remove a portion of the underlying susceptor. Even if the susceptor includes SiC impregnated with elemental Si, one of ordinary skill in the art would have expected the SiC in the underlying susceptor to have been etched and leave the elemental Si and gaps (where SiC was previously present) along the outermost surface of the susceptor. Because one of ordinary skill in the art would have expected the SiC to provide substantially mechanical support, removing the SiC would have substantially degraded the mechanical integrity of the semiconductor processing component. Thus, the modification does not have a reasonable expectation of success. M.P.E.P. § 2143.02.

Kumar is cited for its teaching of CVD SiC. One of ordinary skill in the art would not have combined Thilderkvist and Kumar for at least the reasons previously described with respect to using the same material for a susceptor and its sacrificial layer.

Therefore, Applicants respectfully submit that claim 1 is not obvious over Thilderkvist in view of Kumar because one of ordinary skill in the art would not have had an expectation of success when a substrate and a layer directly on the substrate both include SiC, due to the repeated coatings and removals of the layer as taught by Thilderkvist. Claims 5, 6, 8, 9, 14 to 19, and 21 depend directly or indirectly from claim 1 and are not obviously at least for the reasons previously described with respect to claim 1. Applicants respectfully request withdrawal of the rejection of claims 1, 5, 6, 8, 9, 14 to 19, and 21.

#### **Obviousness Rejection of Claim 7**

Applicants respectfully traverse the rejections under 35 U.S.C. § 103(a) of claim 7 as being obvious over Thilderkvist in view of Kumar, and further in view of U.S. 6,488,497 ("Buckley"). Claim 7 indirectly depends from claim 1 and is not obvious at least for the reasons previously described with respect to claim 1. Applicants respectfully request withdrawal of the rejection of claim 7.

#### **Obviousness Rejection of Claim 10**

Applicants respectfully traverse the rejection under 35 U.S.C. § 103(a) of claim 10 as being obvious over Thilderkvist in view of Kumar, and further in view of U.S. 6,890,861 ("Bosch"). Claim 10 is drawn to a semiconductor processing component that consists essentially of CVD-SiC.

The combination of Thilderkvist and Kumar has been previously discussed with respect to the rejection of claims 1, 5, 6, 8, 9, 14 to 19, and 21. Bosch is cited for its teachings of SiC components or SiC/Si components, such as liners, process tubes, paddles and boats, formed by either sintering and/or CVD processes. However, Kumar teaches away from semiconductor processing components that are sintered SiC, whether by itself or coated with CVD SiC. More particularly, silicon carbide presents substantial fabrication problems for the complex parts required of plasma reactors. Silicon carbide is one of the hardest commonly found materials and is thus difficult to machine. Indeed, most cutting tools have silicon carbide tips. *See* Paragraphs

[0010] and [0013] of Kumar. To overcome these problems, Kumar teaches infiltrating a sintered SiC with molten silicon, and performing final machining after infiltration. *See* FIG. 2 of Kumar. Thus, Kumar teaches away from a semiconductor processing component that consists essentially of SiC, and thus, a *prima facie* case of obviousness has not been established by a combination of Thilderkvist, Kumar, and Bosch. Therefore, Applicants respectfully submit that claim 10 is not obvious over Thilderkvist in view of Kumar and further in view of Bosch and request withdrawal of the rejection of claim 10.

### **Obviousness Rejection of Claim 20**

Applicants respectfully traverse the rejections under 35 U.S.C. § 103(a) of claim 20 as being obvious over Thilderkvist in view of Kumar and U.S. 5,494,439 ("Goldstein"). Claim 20 is drawn to a wafer boat comprising a substrate and a layer. The substrate consists essentially of SiC impregnated with elemental silicon, and the layer consists essential of CVD-SiC and is directly on the substrate.

Thilderkvist and Kumar have been addressed above with respect to the rejection of claims 1, 5, 6, 8, 9, 14 to 19, and 21. Goldstein teaches removing a silicon fill and then refilling the remaining SiC with new silicon, as opposed to CVD-SiC. Similar to Thilderkvist, Goldstein takes advantage of the differences of the materials in order to remove the Si without removing the SiC. The addition of Goldstein does not make up for the deficiencies in Thilderkvist and Kumar. Therefore, one of ordinary skill in the art would not have modified a combination of Thilderkvist and Kumar with Goldstein to achieve the claimed invention due to the lack of a reasonable expectation of success. Therefore, Applicants respectfully submit that claim 20 is not obvious over Thilderkvist in view of Kumar and Goldstein and request withdrawal of the rejection of claim 20.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims. Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to contact Applicants' undersigned attorney at the number listed below.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

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Date

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